

Application
for
United States Patent

To all whom it may concern:

*Be it known that, Brian J. Berdan, James E. Jirele, and Brian C. Peterson
have invented certain new and useful improvements in*

EXTENSIBLE JACK HANDLE

of which the following is a full, clear and exact description:

EXTENSIBLE JACK HANDLEFIELD OF THE INVENTION

The present invention relates generally to jack handles. More particularly,
5 the present invention relates to handles for low profile lifting devices, such as
devices for lifting vehicle transmissions, clutches, or other parts, wherein the
device has a handle that may be adjusted to varying lengths.

BACKGROUND OF THE INVENTION

10 Many motor vehicles are designed so that certain parts, such as
transmissions and clutches, are removed and/or installed from the underside of
the vehicle. This design facilitates installation and removal of the parts because
such parts are often very heavy, and thus they can be more easily raised and
lowered from the underside than from above the vehicle. Such parts are typically
15 raised into place and/or lowered from the vehicle with a jack that provides
support for the part.

Most vehicle jacks have handles of finite lengths. However, a handle of
finite length often is not desirable in varying working conditions. For example,
if the handle is too short, when the jack is under the vehicle the user will be
20 limited in its ability to place the jack in locations under the vehicle that are out of
reach. In addition, a short handle requires more force to raise and/or lower the
jack. Conversely, if the handle is too long, activation of the jack may be

interfered with by other parts of the vehicle, such as tires or other parts. In addition, a wide clearance space around the vehicle is required to install a jack having a long handle.

Prior art jacking devices have attempted to solve this problem by providing jack handles of varying lengths. However, the means by which handles of varying length have been provided have been limited to providing multiple length handles, and the user has thus been required to remove and install a new handle whenever a handle of different length is desired. In addition, multi-part handles have been provided, but such handles also require the user to add additional parts as additional length is desired. For example, a handle made in two sections which are temporarily connected together to operate the jack and then separate it into two pieces for storage is disclosed in U.S. Patent No. 2,671,636.

It is therefore desirable to provide an extensible handle for use with jacks, dollies, and other items such that the user to extend and retract the handle without removal or addition of parts to the handle.

SUMMARY OF THE INVENTION

It is therefore a feature and advantage of the present invention to provide an improved handle that may be extended and retracted to multiple positions without requiring the installation of removal of handle parts.

The above and other features and advantages are achieved through the use

of a novel extendible jack handle as herein disclosed. In accordance with one embodiment of the present invention, an extensible handle includes a first elongated member having two ends, the first of which is positioned to engage a device to be operated. The first elongated member also has an expanded portion, which has an increased width, and a narrow portion, which has a width that is narrower than that of the expanded portion. The handle also includes a hollow second elongated member that has two ends and a restricting means. The second elongated member is positioned to receive, into one or both of its ends, the first elongated member.

10 Optionally, the restricting means has a width that is narrower than the width of the expanded portion of the first elongated member. Optionally and preferably, the restricting means restricts the expanded portion of the first elongated member from fully passing through both ends of the second elongated member.

15 As additional options, the first elongated member and/or the second elongated member may be comprised of steel, iron, aluminum, another metal, a composite material such as a carbon fiber composite material, and/or a resilient plastic, optionally including a reinforced plastic such as a fiberglass reinforced plastic. The first elongated member may also include at least one locking means, such as a receptacle, groove, or notch sized and positioned to securely receive an item such as a pin. The second elongated member may also include a locking means positioned to receive the pin and prevent extension and/or retraction of the

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handle. In accordance with an optional and preferred embodiment, activation of the handle by a user activates a jacking device or dolly.

In accordance with an additional embodiment of the present invention, an apparatus for moving an item includes a base, a supporting means positioned
5 above the base, and an arm having two ends. The arm is positioned so that one end is pivotally related to the supporting member and the other end is pivotally related to the base. The apparatus also includes a lifting means and a handle. The handle includes a first elongated member having two ends, the first end positioned to be received by the apparatus. The second end has an expanded
10 portion of an increased width relative to another portion of the first elongated member. The handle also includes a second elongated member having two ends. The second elongated member is hollow and is positioned to receive the first elongated member into one of the ends. The second elongated member also includes a restricting means having a width that is narrower than the width of the
15 expanded portion of the first elongated member.

Optionally and preferably, the restricting means restricts the expanded portion of the first elongated member from fully passing through the second elongated member. Further, activation of the handle by a user preferably activates the lifting means, which in turn activates the arm and vertically moves the
20 supporting means.

As additional options, at least one of the first and the second elongated member may be comprised of steel, iron, aluminum, another metal, a composite

material and/or a resilient plastic, optionally including a reinforced plastic. Also, the first elongated member may include at least one locking means, such as a receptacle, groove, or notch sized and positioned to securely receive an item such as a pin. The second elongated may also include a locking means positioned to
5 receive the pin and prevent extension and/or retraction of the handle.

In accordance with yet another embodiment of the present invention, an extensible handle includes a first elongated member having two ends, an expanded portion of increased width, and a narrow portion of reduced width relative to that of the expanded portion. The handle also includes a hollow
10 second elongated member having two ends. The second elongated member is positioned to telescopically receive the first elongated member. The second member also includes a means for restricting the expanded portion of the first elongated member from fully passing through both ends of the second elongated member.

15 Optionally, the first elongated member also includes a means for restricting movement of the first elongated member on an axis relative to the second elongated member. Optionally and preferably, the handle further includes a means for preventing extension and/or retraction of the handle. Also optionally and preferably, the first elongated member further includes a means for securing
20 the first elongated member to a device to be operated, and the first elongated member and/or the second elongated member may be comprised of metal.

There have thus been outlined the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be
5 described below and which will form at least part of the subject matter of the claims appended hereto.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth
10 in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein, as well as the abstract included below, are for the purpose of description and should not be regarded as limiting in any way.

15 As such, those skilled in the art will appreciate that the concept and objectives, upon which this disclosure is based, may be readily utilized as a basis for the design of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do
20 not depart from the spirit and scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 provides a side view of a jack having a preferred embodiment of an extensible handle.

FIG. 2 provides a perspective view illustrating several elements of a first member of a preferred embodiment of an extensible handle.

FIG. 3 provides a perspective view illustrating several elements of a second member of a preferred embodiment of an extensible handle.

FIG. 4 provides a perspective view of a collar that may be used with a preferred embodiment of the present inventive handle.

DETAILED DESCRIPTION OF PREFERREDEMBODIMENTS OF THE INVENTION

A preferred embodiment of the present invention provides an improved extensible handle that allows the handle to be used in multiple positions corresponding to multiple lengths. The handle may be used with any type of item, and it is preferably used with a jack or dolly for the movement of vehicle parts. The handle is particularly useful for vehicle jacks such as those used to raise or lower a clutch or transmission underneath a vehicle.

The handle may be extended to provide for increased length so that the jack can be moved into positions requiring a long reach. The increased length also allows for operation of the jack with lower force than would be required for a shorter handle. Increased length is also desirable in applications where the

handle is used as a tow bar, such as with a dolly. The handle also may be retracted into a shorter position to allow for improved maneuverability of the jack in confined or obstructed areas. Preferably, the handle may be extended or retracted without removal of the handle from the jack or dolly and without
5 addition or removal of parts to the handle.

FIG. 1 illustrates an example of a jack that is equipped with a preferred embodiment of the present inventive extensible handle. The jack includes a base
2. The jack also includes a support means 6 or other piece, such as a platform, handle, hook, latch, screw, or other item, on which an item to be raised and/or
10 lowered by the jack may rest. An arm 4 is pivotally connected both to the platform 6 and the base 2. . The jack is also equipped with an extensible handle 10 comprised of an inner member 12 and a hollow outer member 16.

A lifting mechanism 8 such as a hydraulic cylinder, pump, spring, or other device is also provided so that when the lifting mechanism 8 is operated, the arm
15 4 is raised or lowered, thus raising or lowering the support member 6. For example, the lifting mechanism 8 may be a hydraulic cylinder positioned horizontally under the handle 10 and along the base 2. In such an embodiment, the cylinder is preferably equipped with a ram that extends when the cylinder is operated. When the ram extends from the cylinder, it pulls the arm 4, which
20 vertically raises the support member 6. Of course, other configurations and embodiments of lifting mechanism 8 may be used, such as cylinders in other positions, springs, latches, and other devices, all of which may be used with the

present inventive handle. The handle **10** is received by the jack at a connector **20** such as a screw receptacle, pin receptacle, latch, or other mechanism positioned so that when handle **10** is operated, the lifting means **8** is also operated, thus raising or lowering the arm **4** and support member **6** as appropriate.

5 FIG. 2 provides an expanded view of the inner member **12** of the handle.

Referring to FIG. 2, the inner member includes a first end **14** that is designed to be received by the jack's connecting mechanism **20**. First end **14** may be threaded or it may be equipped with other features, such as one or more notches, grooves, hooks, extensions, or other items to engage the receptacle **20**. The other
10 end of first member **12** includes an expanded portion **22** having a width or diameter that is larger than the width or diameter of the remainder of inner member **12**. End **14** may also have a width that is optionally less than, greater than, or equal to that of the remainder of the support member, which width may even optionally be less than, greater than, or equal to that of the expanded portion
15 **22**.

An expanded view of the outer member **16** is illustrated in FIG. 3. Referring to FIG. 3, the outer member **16** includes a first opening **17** and a second opening **19**. A restriction **18** is provided in order to provide an inner diameter that is smaller than the inner diameter of other portions of the member.
20 Preferably, the restriction **18** is near second opening **19** as illustrated in FIG. 3, although restriction **18** may in fact be located anywhere along the outer member **16**.

The extendible handle is assembled by placing the first end **14** of the inner member **12** in to the outer member **16** by passing the first end **14** through opening **17** until the expanded portion **22** of the inner member contacts the restriction **18**.

Restriction **18** prevents inner member **12** from being passed entirely through outer member **16** but allows for movement of inner member **12** along its length until extended portion **22** contacts the restriction **18**. Inner member **12** and outer member **16** are thus telescopically related to each other. The handle is then attached to the jack by attaching the first end **14** of inner member **12** to receptacle **20**.

The embodiments of the inner member and outer member illustrated in FIGs. 2 and 3 are merely intended to be illustrative, and other embodiments may be used. For example, inner member **12** and outer member **16** may be of any length. Further, the relative lengths of the expanded portion **22**, the first end **14**, and the remaining portion of inner member **12** may be longer or shorter than that illustrated in FIG. 2, depending on the desired application. In addition, although FIG. 3 illustrates restriction **18** as a groove around the entire circumference of outer member **16**, any restriction, such as one or more pins and/or raised portions placed inside of outer member **16** may be used. Preferably, as illustrated in FIG. 2, restriction **18** is located near one of the ends of outer member **16**, although optionally restriction **18** may be located at any location along outer member **16**. In addition, although the shapes of inner member **12** and outer member **16** are shown to be cylindrical, other shapes such as square, rectangular, triangular, or

any other shapes may be used to form the inner member **12** and outer member **16**.

Further, although outer member **16** must be hollow, inner member **12** may be either solid or hollow.

FIG. 2 illustrates that inner member **12** is also preferably equipped with
5 one or more receptacles **24** and **26** or other locking means so that restricting
devices can be attached to the inner member in order to lock the inner member
into one or more positions. For example, FIG. 2 illustrates receptacles **24** and **26**
as being holes through which a pin may be passed. The diameter of the pin is
preferably slightly larger than the diameter of the hole so that the pin requires
10 some amount of force to be inserted into the hole and does not fall out of the hole
without force being applied. When inner member **12** is passed through outer
member **16**, pins may then be inserted into the receptacles **24** and/or **26** to prevent
the handle from extending or retracting past the position of the pin. Optionally,
outer member **16** may be equipped with a sleeve or collar **34** such as is illustrated
15 in FIG. 4. Sleeve **34** includes one or more notches or grooves **30** and **32** designed
to receive the pins and hold the inner member and outer member in place relative
to each other without expansion or retraction during operation of the handle.
Other locking mechanisms, such as grooves or notches instead of receptacles, or
entirely different devices such as latches, hooks, or clips, may also be used to
20 restrict extension and/or retraction of the handle.

The present inventive handle may be made of any material having
sufficient strength to allow for operation of the jack or dolly, such as steel tubing.

Steel tubing is preferable because it reduces the weight of the handle while providing strength that can withstand a significant force. However, aluminum tubing or solid aluminum may be used depending on the amount of force that is required. Other materials, such as wood, a composite material such as a carbon fiber composite, resilient plastic, or a reinforced plastic such as a fiberglass reinforced plastic may be used for applications requiring lesser force.

The design of the present inventive handle permits the user to reduce the overall length of the handle when working in a confined space such as underneath a vehicle. It also allows the user to variably increase the length of the handle to reduce the effort required to raise a given load or to increase the handle length to allow the handle to extend to hard-to-reach areas. An increased handle length also allows the handle to act as a tow bar from moving the jack or dolly across the floor. The extended handle, by allowing the user to use less force, permits the user to handle larger loads on the jack.

The many features and advantages of the invention are apparent from the detailed specification, and thus, it is intended by the appended claims to cover all such features and advantages of the invention which fall within the true spirits and scope of the invention. Further, since numerous modifications and variations will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation illustrated and described, and accordingly, all suitable modifications and equivalents may be resorted to, all of which may fall within the scope of the invention.